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RESEARCH ARTICLE

PULMONARY FUNCTION TESTS IN STAINLESSSTEEL UTENSIL POLISH WORKERS-A CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: The pulmonary function tests give an objective assessment of the functional status of the respiratory system and indicate the nature and extent of the functional disturbance in disorders associated with pulmonary impairment and disability. Spirometry is valuable in industrial medicine, to study the lung involvement in occupational diseases which occur in workers of textile mills, coal mines and other occupations in which they are exposed to various forms of air pollutants. Several research workers have confirmed the ill effects of air pollutants on respiratory functions of human being. In stainless steel utensil polishing industries the workers are exposed to carbon black and chromium dust. This prompted us to undertake this study to assess the pulmonary function tests in the stainless steel utensil polish workers.

Aim: To perform pulmonary function test in stainless steel utensil workers to evaluate and analyze whether long term occupational exposure to stainless steel utensil polishing dust which contains carbon black and chromium affects lung functions.

Materials and Methods: This cross sectional study was carried out to assess and evaluate the effects of stainless steel utensil polishing dust on the lung function. The study involved 65 male workers exposed to stainless steel utensil polishing dust and 50 healthy individuals as control group. The workers were aged between 18-32 years and the duration of employment was above 5 years. The control group also aged between 18-32 years. The micromedical superspiro was used for this study. The procedure was explained to the subject repeatedly in detail. The maneuver was demonstrated to each subject separately before performing the test. The pulmonary function test was conducted by seating the subject comfortably in chair with spine erect position. The following functional parameters, Forced Expiratory Volume in first second (FEV_1), Forced Vital Capacity (FVC), Peak Expiratory Flow Rate (PEF), FEV_1 as percentage of VC (FEV_1/VC), Maximum Expired Flow Rate at 75%, 50%, 25% of FVC remaining such as MEF_{75}, MEF_{50}, MEF_{25}, Mean Mid Expiratory Flow Rate (MMEF Or FEF $_{25\text{-}75\%}$), Maximum Voluntary Ventilation Indicated (MVV $_{Ind}$), Forced Inspiratory Volume In First Second (FIV_1), Forced Inspiratory Vital Capacity (FIVC), Peak Inspiratory Flow Rate (PIF), Maximum Expiratory Flow Rate 50/ Maximum Inspiratory Flow Rate 50 (MEF_{50}/ MIF_{50}), Forced Expiratory Time (FET) were studied.

Results: The FEV_1, FVC, PEF, FEV_1/FVC, MEF_{50}, MEF_{25}, MMEF, MVV_{Ind}, FIV_1, FIVC, PIF, MEF_{50}/ MIF_{50} and FET values were used for this study. The data collected were statistically analysed by using students't'- test. Having analysed the results in our study the following was inferred. The FEV_1, FVC, PEF, MEF_{75}, MEF_{50}, MMEF, MVV_{Ind}, FIV_1, FIVC, PIF, FET showed significant decrease in stainless steel utensil polish workers than control group. The FEV_1/ FVC, MEF_{50}/ MIF_{50}, MEF_{25} showed a slight increase in stainless steel utensil polish workers when compared to control group, suggesting a restrictive pulmonary parenchymal disease.

Conclusion: As per the PFT results, among the 65 polish workers 26 workers have mild restriction, 16 workers have moderate restriction and 23 workers have severe restriction. Hence it is concluded that yearly assessment of pulmonary function is necessary for evaluation of the respiratory risk from carbon black and chromium dust environment to plan further preventive intervention.

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INTRODUCTION

Pulmonary function tests are very useful for evaluation of the lung function in respiratory disorders. The pulmonary function tests give an objective assessment of the functional status of the respiratory system and indicate the nature and extent of the functional disturbance in disorders associated with pulmonary impairment and disability. The instrument used is spirometer. It records the amount of air and rate of air that is breathed into and out of the lungs over a specified time. Serial measurements are useful in assessment of the type and extent of lung dysfunction, detection of early evidence of lung disease, longitudinal surveillance in occupational settings, follow up of response to therapy, determining the prognosis and disability evaluation. Preoperative assessment is very useful in thoracic and general surgery. All pulmonary function tests are measured against predicted values derived from large studies of healthy subjects. In general, these predictions vary with age, gender, height and to a less extent weight and ethnicity. All volumes and flow rates are expressed at body temperature, ambient pressure and saturated with water vapour (BTPS) by multiplying the test value with the factor which for different temperature is obtained from the BTPS tables. The test value will depend largely on the understanding, co-operation and motivation on the part of the subject. Spirometry is valuable in industrial medicine, to study the lung involvement in occupational diseases which occur in workers of textile mills, coal mines and other occupations in which they are exposed to various forms of pollutants. The degree of functional impairment has direct relationship with the dust concentration and duration of exposure. Prolonged exposure to dust results in chronic bronchial symptoms. Investigation of the respiratory health effects from dust exposure is necessary to predict the risk factors. Several research workers have confirmed the ill effects of air pollutants on respiratory functions of human beings. In stainless steel utensil polishing industries the workers are exposed to carbon black and chromium dust. They are not provided with any protective mask. Every day the polish workers are polishing approximately 100g stainless steel utensils and exposed to the carbon black and chromium dust for more than 6 hours. Their working place is often poorly ventilated. This prompted us to undertake this study to assess the pulmonary function tests in the stainless steel utensil polish workers. The study also included a control group comprising of healthy individuals for comparison.

Aim

1. To perform pulmonary function test in stainless steel utensil workers.
2. To do a comparative study on the lung function tests in the control group.
3. To evaluate and analyze whether long term occupational exposure to stainless steel utensil polishing dust which contains carbon black and chromium affects lung functions.
4. To compare the study with other similar studies.

MATERIALS AND METHODS

Instrument

The micromedical superspiro was used for this study. This is a powerful and sophisticated desktop spirometer developed by micromedical limited, England. This comprehensive suite of analysis and management software is packaged in a sleek, compact desktop unit with a built-in colour monitor and thermal printer powered by a rechargeable internal battery pack. Extra features include USB storage support, touch screen facilities and a modern graphical user-interface. The spirometer uses the micromedical volume transducer, an extremely stable form of volume transducer, which measures expired air directly at BTPS (body temperature and pressure with saturated water vapour) thus avoiding the inaccuracies of temperature corrections. This transducer is insensitive to the effect of condensation and temperature hence avoids the need for individual calibration prior to performing a test. The superspiro has many advanced features including a ¼ VGA colour LCD display giving real time flow/volume or volume/time curves, user customization of instrument functions, predicted values and the ability to carry out pre and post bronchodilator and bronchial challenge testing. The spirometry measurements, flow/volume loop and volume time curve may be printed at the time of testing or at any time subsequently from memory and also capable of saving the results whenever required. One unique feature is the ability to expand the capabilities of the instrument by simply downloading new software modules supplied with other transducers.

Contents of the instrument

1. Superspiro
2. Micromedical digital volume transducer
3. Transducer housing
4. Universal AC adapter
5. Stylus X_3
6. USB cables
7. RS-232 cable

Overview

The superspiro has many configurable options and it is highly recommended that these be configured prior to use. Once configured the settings are stored in permanent memory and will remain unchanged until reconfiguration is required. The subject details are stored in permanent memory and can be recalled at a future date to perform subsequent tests. The results of all the tests performed may then be displayed on a trend graph to monitor the course of the illness.

Navigation and usage

The superspiro has been designed for use with a stylus on the touch screen. The screen and icons are easy to understand and use. All the buttons or icons can be activated by touching them a single time with the stylus. The area at the top gives the name of the selected patient, together with the name of the menu. The available options fall into two categories.

1. Spirometry, Rint, Challenge
2. Trend, Setup, Patient's menu

On-Screen key board

When entering a value inside a text field, the superspiro will automatically display a "QWERTY" keyboard on screen. Using the stylus, simply touch the keys as in a normal computer key board. The spirometry test may be performed with forced or relaxed expiration and inspiration with or without tidal breathing.

Best Criteria

The criterion for the automatic selection of the best maneuver from a series of spirometry tests may be selected. The options are maximum FEV_1, FVC, PEF, sum of FEV1+ FVC or best individual indices. The selected criterion is used to automatically select the best blow when saving, printing or reporting on a series of maneuvers. If individual best is selected then the greatest individual indices from a series of maneuvers are selected except the indices derived from the flow/ volume loop. These indices (MEF_{75}, MEF_{50}, and MEF_{25}) are measured from the composite flow/volume curve by the method described by ERS –standardized lung function testing.

Subject

This cross sectional study was carried out to assess and evaluate the effects of stainless steel utensil polishing dust on the lung function. The inclusion criterion for the subject was a minimum 5 years of employment in the stainless steel utensil polish industry. The study involved 65 male workers exposed to stainless steel utensil polishing dust and 50 healthy individuals as control group. The workers were aged between18-32 years and the duration of employment was above 5 years. The control group also aged between 18-32 years. No significant smoking habit was found in the polish workers. The control groups were non smokers. A detailed history of occupational exposure was obtained. The stainless steel utensil polish dust exposure time was 6-8 hours daily. Their working places were poorly ventilated. The respiratory impairment was evaluated by means of a standardized questionnaire. The workers with symptoms suggesting infective pathology of respiratory system were excluded from the study. The workers underwent general examination to rule out any significant medical illness related to any system before performing PFT.

Technique

The pulmonary function test was conducted by seating the subject comfortably in a chair with spine erect position. The subjects were instructed for proper understanding and cooperation. This was essential to obtain the best values.

Forced Vital Capacity test

The procedure was explained to the subject repeatedly in detail. The maneuver was demonstrated to each subject separately before performing the test. Disposable mouth pieces were used. The subject details about age, sex, height, weight, sex, ethnicity and smoking habits were entered in the spirometer. The spirometry screen is displayed showing the predicted flow/ volume curve as a dashed line or a shaded area depending on the setting. The disposable mouth piece was inserted into the transducer holder. The subject was instructed to breathe in until their lungs were completely full and then seal their lips around the mouth piece and close the nostril by nose clip. The subject was asked to blow out as hard and as fast as possible until he cannot push any more air out, then to breathe in fully, immediately after the expiratory maneuver, thus completing the flow/ volume loop. At the end of the test FEV_1, FVC and PEF values are displayed together with flow/ volume loop. There are five quality checks performed on each spirometry maneuver to determine its acceptability.

1. Good blow
2. Slow start
3. Poor effort
4. Abrupt end
5. Cough detected

The test was repeated as many times as necessary to achieve acceptable results and finally selected the best blow result for study.

The following functional parameters were studied

1. Forced Expiratory Volume in First Second (FEV_1)
2. Forced Vital Capacity (FVC)
3. Peak Expiratory Flow Rate (PEF)
4. FEV_1 as Percentage of VC (FEV_1/VC)
5. Maximum Expired Flow Rate at 75%, 50%, 25% of FVC remaining such as MEF_{75}, MEF_{50}, MEF_{25}.
6. Mean Mid Expiratory Flow Rate (MMEF or FEF $_{25-75\%}$)
7. Maximum Voluntary Ventilation Indicated (MVV $_{Ind}$)
8. Forced Inspiratory Volume in First Second (FIV_1)
9. Forced Inspiratory Vital Capacity (FIVC)
10. Peak Inspiratory Flow Rate (PIF).
11. Maximum Expiratory Flow Rate 50/ Maximum Inspiratory Flow Rate 50 (MEF_{50}/ MIF_{50})
12. Forced Expiratory Time (FET).

The first part of the report gives the patient name, ID and physical details. This is followed by the results (FEV_1, FVC and PEF) for all the recorded maneuvers. The percentage of predicted value, percentage change and the normal range are also being given. The results are followed by the flow/ volume and volume/ time curves.

RESULTS

The results derived by data analysis in this study are presented in tables. The mean values with their standard deviation of individual variables and controls were calculated by using the appropriate formula and tabulated.

Table 1. Observed mean values and standard deviation of polish workers and controls

Parameters	Polish worker (mean ± SD)	Control (mean ± SD)	p value	Significance
FEV_1	2.00 ± 0.45	2.88 ± 0.54	p < 0.001	VHS
FVC	2.01 ± 0.46	2.95 ± 0.56	p < 0.001	VHS
PEF	3.47 ± 9.55	426.14 ± 112.46	p < 0.001	VHS
FEV_1/ FVC	99.45 ± 1.76	97.46 ± 4.98	p < 0.01	HS
MEF_{75}	5.42 ± 1.72	6.84 ± 1.87	p < 0.001	VHS
MEF_{50}	4.37 ± 1.30	5.14 ± 1.25	p < 0.001	VHS
MEF_{25}	2.95 ± 1.06	2.92 ± 0.97	p > 0.05	NS
MMEF	4.16 ± 1.37	4.64 ± 1.13	p < 0.05	S
MVV $_{Ind}$	73.5 ± 18.26	108.32 ± 20.34	p < 0.001	VHS
FIV_1	1.62 ± 0.44	2.11 ± 0.63	p < 0.001	VHS
FIVC	1.73 ± 0.47	2.62 ± 0.60	p < 0.001	VHS
PIF	178 ± 5.92	216.50 ± 71.58	p < 0.01	HS
MEF $_{50}$/MIF $_{50}$	172.77 ± 5.74	167.50 ± 56.90	p> 0.05	NS
FET	0.82 ± 0.42	1.10 ± 0.45	p < 0.01	HS

p < 0.001: VHS-Very Highly Significant
p < 0.01: HS-Highly Significant
p < 0.05: S- Significant
p > 0.05: NS-Non Significant

The FEV_1, FVC, PEF, FEV_1/FVC, MEF_{75}, MEF_{50}, MEF_{25}, MMEF, MVV_{Ind}, FIV_1, FIVC, PIF, MEF_{50}/MIF_{50} and FET values were used for this study. The data collected were statistically analysed by using students't'- test. Having analysed the results in our study the following was inferred. The FEV_1, FVC, PEF, MEF_{75}, MEF_{50}, MMEF, MVV_{Ind}, FIV_1, FIVC, PIF, FET showed significant decrease in stainless steel utensil polish workers than control group. The FEV_1/FVC, MEF_{50}/MIF_{50}, MEF_{25} showed a slight increase in stainless steel utensil polish workers when compared to control group, suggesting a restrictive pulmonary parenchymal disease.

Table 2. Forced Expiratory Volume in first second (FEV_1) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted-mean ± SD
Polish workers	65	2.00 ± 0.45	2.88 ± 0.31
Control	50	2.88 ± 0.54	2.85 ± 0.48

$p < 0.001$

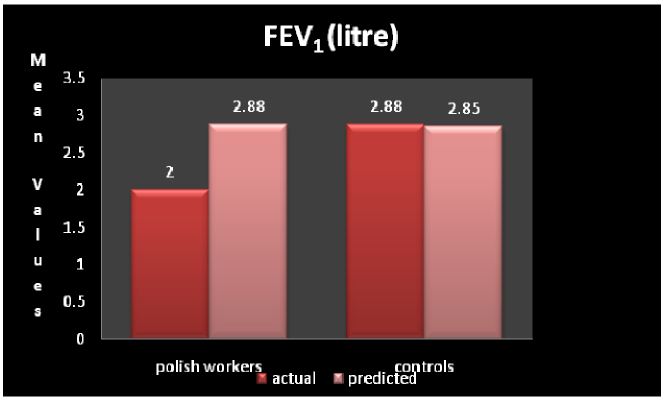


Table 3. Forced Vital Capacity (FVC) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	2.01 ± 0.46	3.59 ± 0.34
Controls	50	2.95 ± 0.56	3.58 ± 0.53

$p < 0.001$

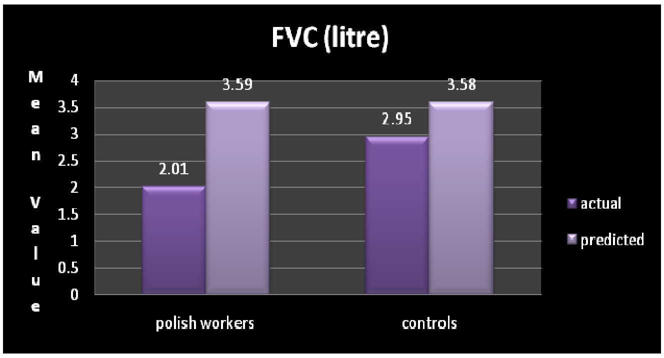


Table 4. Peak expiratory flow rate Mean value and standard deviation

Subject	No	Actual-mean ± SD	Predicted- mean ± SD
Polish workers	65	347.91 ± 95.51	464.17 ± 27.79
Controls	50	426.14 ± 112.46	463.10 ± 40.17

$p < 0.001$

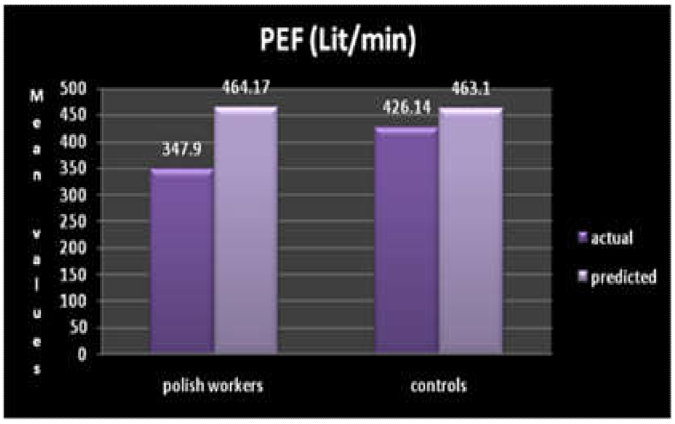


Table 5. FEV1 as a percentage of FVC (FEV_1/FVC or FEV_1%) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	99.45 ± 1.76	76.91 ± 1.67
Controls	50	97.46 ± 4.98	76.62 ± 1.48

$p < 0.01$

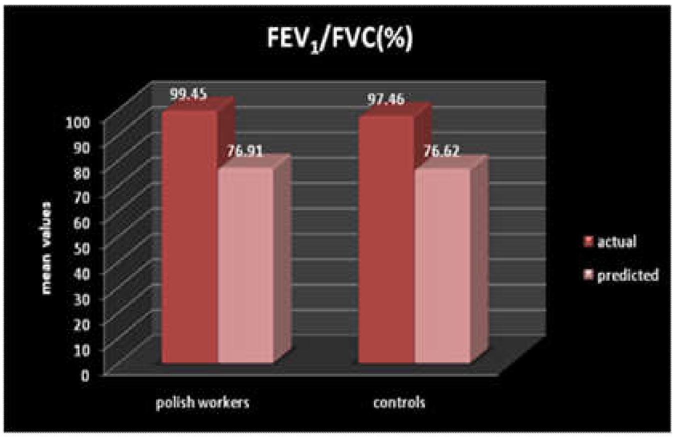


Table 6. Maximum Expired Flow 75% of FVC (MEF75) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	5.42 ± 1.72	6.80 ± 0.35
Controls	50	6.84 ± 1.87	6.79 ± 0.54

$p < 0.001$

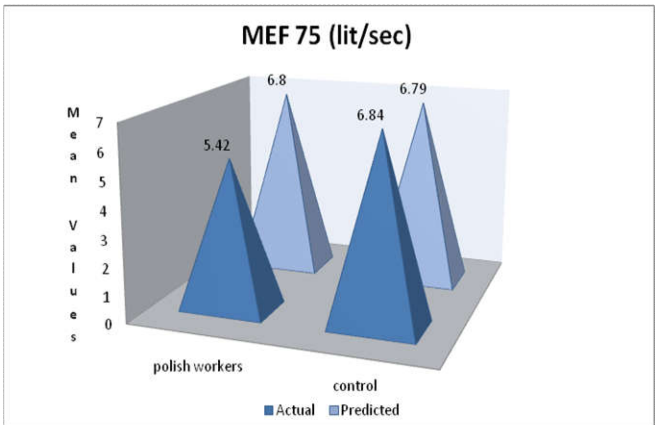


Table 7. Maximum Expired Flow 50% of FVC (MEF50) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	4.37 ± 1.30	4.08 ± 0.31
Controls	50	5.14 ± 1.25	4.04 ± 0.46

$p < 0.001$

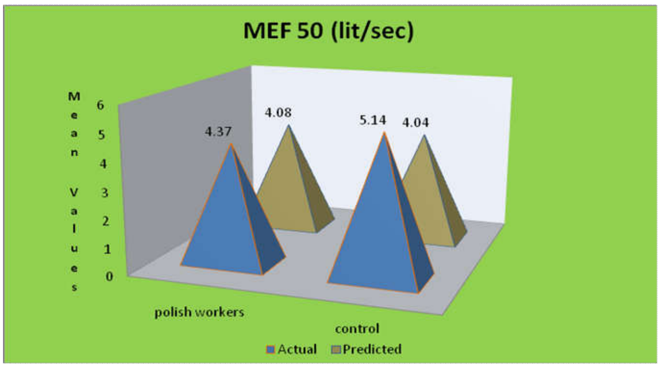


Table 8. Maximum Expired Flow 25% of FVC (MEF25) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	2.95 ± 1.06	1.44 ± 0.25
Controls	50	2.92 ± 0.97	1.43 ± 0.33

$p > 0.05$

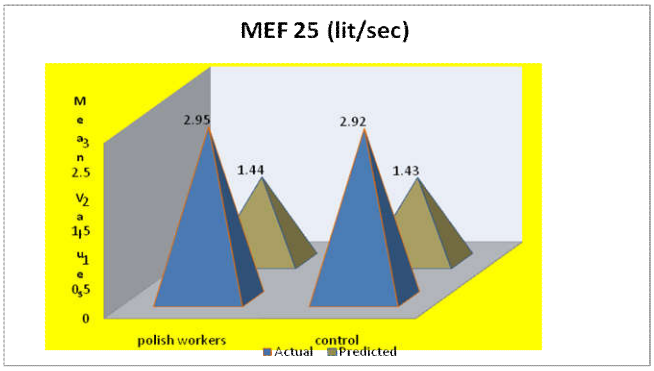


Table 9. Mean Mid Expiratory Flow Rate (MMEF or $FEF_{25-75\%}$) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	4.16 ± 1.37	3.40 ± 0.39
Controls	50	4.64 ± 1.13	3.36 ± 0.44

$p < 0.05$

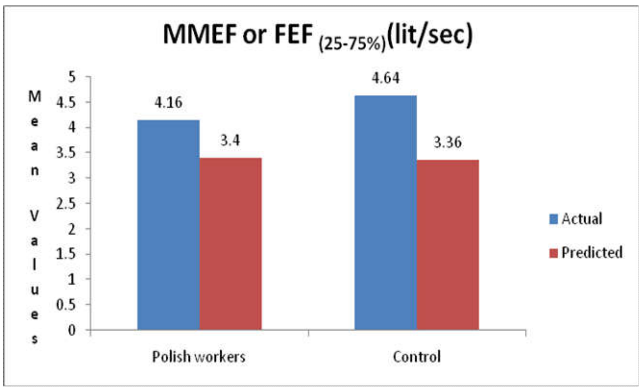


Table 10. Maximum Voluntary Ventilation Indicated (MVV ind) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD	Predicted- Mean ± SD
Polish workers	65	73.5 ± 18.2	108.2 ± 11.8
Controls	50	108.3 ± 20.3	107.8 ± 17.8

$p < 0.001$

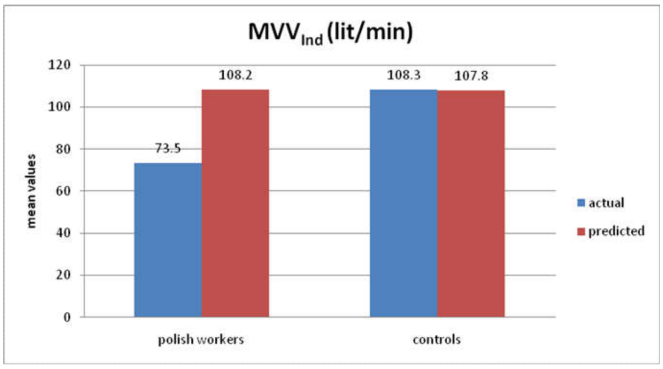


Table 11. Forced Inspired Volume in First Second (FIV1) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD
Polish workers	65	1.62 ± 0.44
Controls	50	2.13 ± 0.63

$p < 0.001$

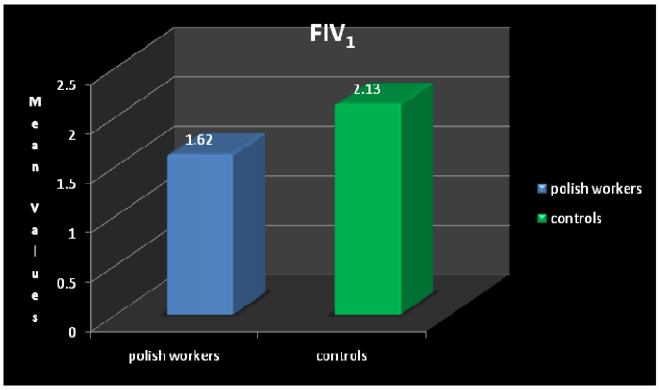


Table 12. Forced Inspiratory Vital Capacity (FIVC) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD
Polish workers	65	1.73 ± 0.47
Controls	50	2.62 ± 0.60

$p < 0.001$

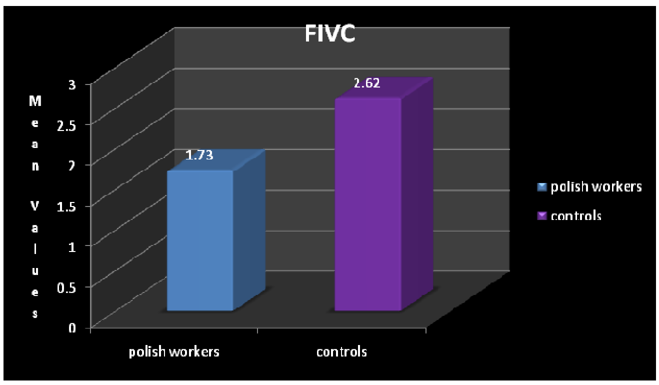


Table 13. Peak Inspiratory Flow Rate (PIF) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD
Polish workers	65	178.82 ± 59.27
controls	50	216.50 ± 71.58

$p < 0.01$

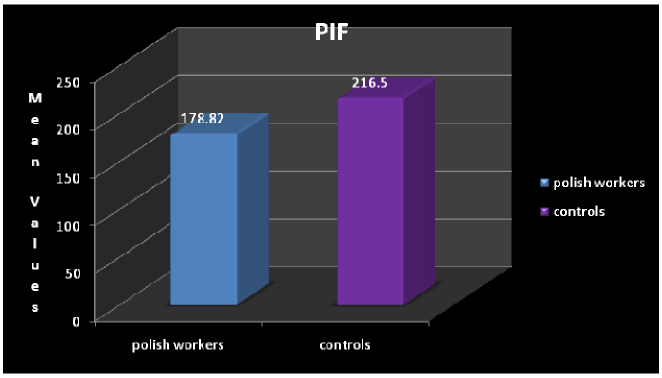


Table 14. Maximum Expiratory Flow Rate 50/Maximum Inspiratory Flow Rate 50 Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD
Polish workers	65	172.77 ± 59.74
Controls	50	167.50 ± 56.90

$p > 0.05$

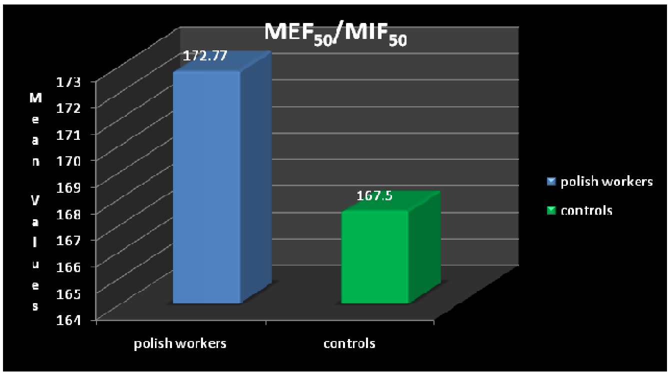
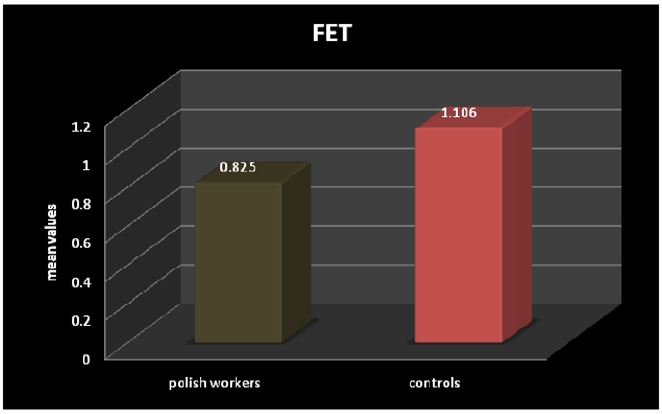


Table 15. Forced Expiratory Time (FET) Mean values and Standard Deviation

Subject	No	Actual-Mean ± SD
Polish workers	65	0.825 ± 0.427
Controls	50	1.106 ± 0.485

$p < 0.01$



DISCUSSION

This study describes the result of cross sectional studies designed to investigate the respiratory health workers exposed to carbon black and chromium dust in stainless steel utensil polish industry. The FEV_1, FVC, PEF, MEF_{75}, MEF_{50}, MMEF, MVV_{Ind}, FIV_1, FIVC, PIF and FET were significantly decreased whereas the FEV_1/FVC, MEF_{50}/MIF_{50}, MEF_{25} showed slight increase in stainless steel utensil polish workers when compared to control group. There is no significant difference in age, height and weight between the polish workers and control group.

Volume measurements (FVC, FEV_1 & MVV):

FEV_1 and FVC are decreased in both obstructive and restrictive lung disease. In obstructive lung disease, fall in FEV_1 is greater compared to fall of FVC. In restrictive lung disease, there is a proportionate fall of FEV_1 and FVC so that the ratio FEV_1/FVC is maintained normal or supranormal. In this study, FEV_1 AND FVC mean values were proportionately decreased in polish workers (tables 1, 2 & 3) when compared to the control. But FEV_1/FVC ratio (FEV_1%) mean values were slightly increased in polish workers (table 5) when compared with controls, suggesting of a restrictive lung disease.

Maximum voluntary ventilation indicated (MVV_{Ind}):

MVV indicates the exercise capacity of the lungs. It is usually reduced in both obstructive and restrictive lung disease. The observed MVV mean values were significantly decreased in polish workers (table 10) than controls. The observed VC reduction is much greater than MVV reduction in our study. This is also in favour of restrictive pulmonary parenchymal disease.

Flow rates

Flow rates are usually decreased in both obstructive and restrictive disease. But fall in flow rate is much greater in obstructive pattern when compared with restrictive pattern.

Peak Expiratory Flow Rate (PEF)

PEF is usually decreased in both obstructive and restrictive lung disease. Sometimes PEF may be raised in case of restrictive lung disease because the stiff lung tends to collapse forcibly thereby increasing the flow rates. In our study the observed PEF, mean values were significantly decreased in polish workers (Table 4) than in controls.

Forced expiratory flow rates (maximum expired flow 75%, 50%, 25% of FVC)

In our study the observed $MEF_{75\%}$, $MEF_{50\%}$ values showed a significant decrease in polish workers (Table 6 & 7) when compared with controls and $MEF_{25\%}$ mean values showed slight increase in polish workers (Table 8) than controls, but remained within physiological limits. Flow rates are preserved normal or slightly higher in restrictive lung disease i.e., disproportionately high relative to the size of the lungs. The expiratory portion of the flow volume curve is tall and narrow due to the preserved flow rates and decreased lung volumes.

Mean mid expiratory flow rate (MMEF or FEF $_{25-75\%}$):

A decrease in MMEF values in the normal capacity lung indicates an early obstructive small airway disease. But in the restrictive lung disease, MMEF decrease is due to low volume capacity. In this study, MMEF mean values were significantly decreased in polish workers (Table 9) than controls.

Forced inspired volume in first second (FIV_1) and forced inspiratory vital capacity (FIVC):

Both FIV_1 and FIVC will be decreased in restrictive lung disease. In our study the observed FIV_1, FIVC mean values were significantly decreased in polish workers (Table 11 & 12) than controls.

Peak Inspiratory Flow rate (PIF):

In restrictive lung disease the inspiratory force generated by the patients is lessened, so the peak inspiratory flow rate will be decreased. But PIF is not much affected in obstructive lung disease. In our study the observed PIF mean values were significantly decreased in polish workers (Table 13) than controls.

Forced Expiratory Time (FET)

FET will be reduced in restrictive lung disease lung disease whereas it is increased in obstructive lung disease. The observed FET mean value in our study was significantly decreased in polish workers (Table 15) than controls suggesting restrictive lung disease. The results obtained in this study are comparable with the following similar studies. In the Indian studies there is a decrease of FEF $_{25-75}$, FEF_{25}, FEF_{50} values in workers of brass and steelware polishing industries in northern India. In the western studies, Huvinen M *et al.*, reported decrease of FVC, FEV_1 values in workers in stainless steel production industry. Bogadi-Sare A *et al.*, reported decrease of FEV_1, PEF, FEF_{75}, FEF_{50}, FEF_{25} values in workers exposed to stainless steel dust by welding and handling stainless steel. Ozdemir *et al.*, reported decrease of FVC, FEV_1, PEF, MMEF values in workers exposed to stainless steel welding fumes. Sobaszek *et al.*, reported decrease of FVC, FEV_1, MMEF, MEF_{50} values in workers exposed to fumes of stainless steel welding on chronic duration. Kilburn KH, *et al.*, reported decrease of FVC, FEV_1, FEF $_{25-75}$ values in stainless steel welding workers. Chen PC *et al.*, reported decrease of FVC, FEV_1 values in workers exposed to stainless steel dust in Taiwanese steel industry. The workers are working in poorly ventilated room. They are not wearing any protective mask to prevent the contaminated dust inhalation during their work. They work continuously from 9.00 am to 4.00 pm. Very rarely they come out of their rooms during working hours. Carbon black and chromium dust released during stainless steel polish work contaminates the atmosphere. Hence the workers have more chances of inhalation of stainless steel utensil polish dust. This study concludes that the stainless steel utensil polish workers are highly vulnerable to respiratory impairment due to inhalation at their work place environment. Both current and cumulative exposure to carbon black and chromium dust have a deleterious effect on respiratory morbidity. In the light of this consistency, it can be stated that there is a clear evidence that exposure to carbon black and chromium has detrimental effect on the pulmonary function variable due to restrictive parenchymal pathology. Consistent with good occupational hygiene practice for any contaminant, work place exposure to carbon black and chromium dust should be controlled to lowest practical level. The strategies namely use of mask, regular health checkup and awareness on health impacts of dust inhalation need to be adapted for protection of the workers.

Summary and Conclusion

This study is to evaluate whether long term occupational exposure to carbon black and chromium dust during stainless steel utensil polish work affects the function or not. 65 male stainless steel utensil polish workers in the exposed group and 50 healthy individuals in the control group were involved in the study. The PFT was done after clinical evaluation by using a computerized spirometer, "micro medical super spiro". This study was conducted during day time in their work place. Forced Vital Capacity test was done. Each and every person was personally called to perform the pulmonary function test. A detailed demonstration was given about the technique to each and every subject. After performing the pulmonary function test, the best values were selected for the study. All the data were analyzed by using students't' – test to determine the significant changes. The students't' – test analysis showed that the FEV_1, FVC, PEF, $MEF_{75,}$ $MEF_{50,}$ MMEF, $MVV_{Ind,}$ FIV_1, FIVC, PIF and FET were significantly decreased in the stainless steel utensil polish workers. The FEV_1/FVC, MEF_{50}/MIF_{50}, MEF_{25} were slightly increased in stainless steel polish workers when compared to the control group. This decrement of PFT values is due to constant inhalation of carbon black and chromium dust at their work place environment. As per the PFT results, among the 65 polish workers 26 workers have mild restriction, 16 workers have moderate restriction and 23 workers have severe restriction. Hence it is concluded that yearly assessment of pulmonary function is necessary for evaluation of the respiratory risk from carbon black and chromium dust environment to plan further preventive intervention.

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